

ARCHIVES

Science Through the Year

CRAIG DANIEL

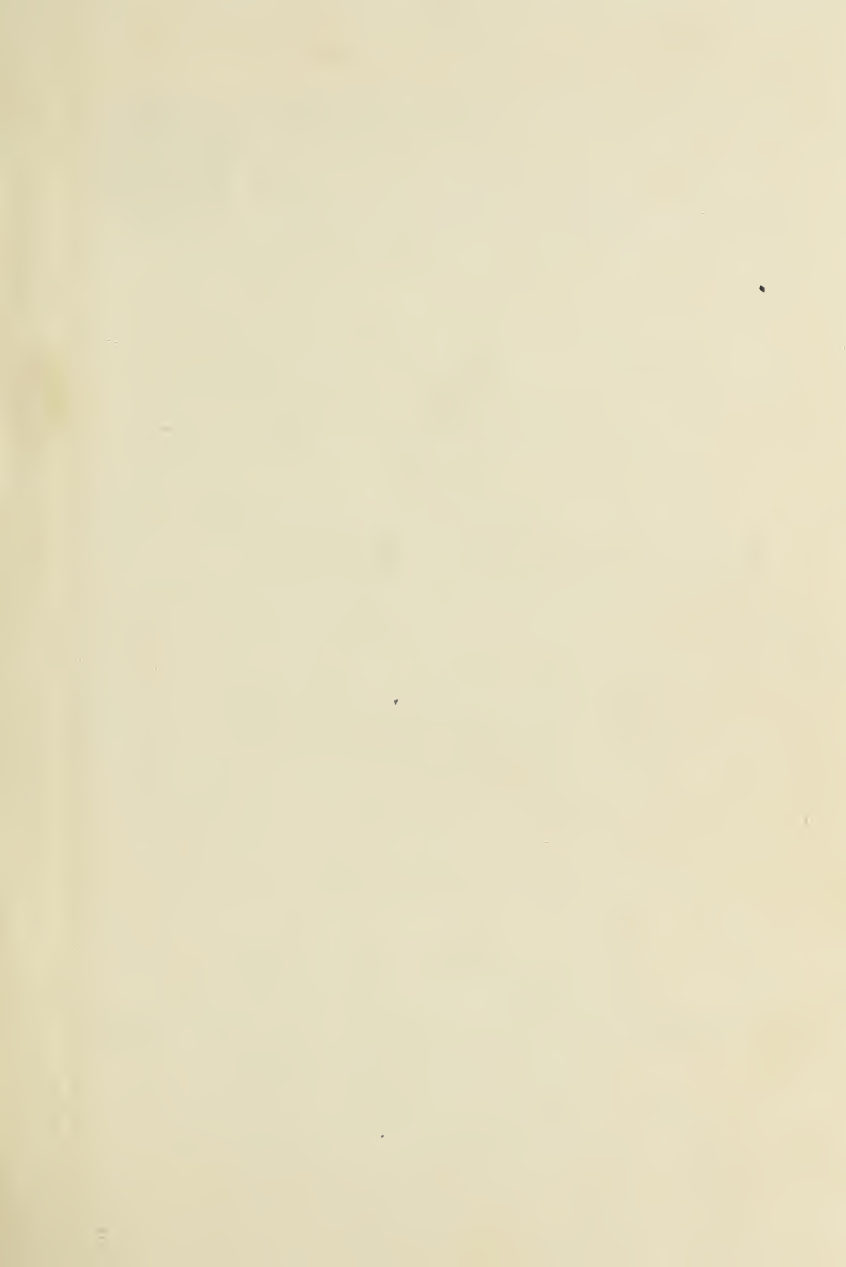
CURRICULUM


OUR WORLD OF SCIENCE



Ex LIBRIS
UNIVERSITATIS
ALBERTAENSIS







Digitized by the Internet Archive
in 2017 with funding from
University of Alberta Libraries



OUR
WORLD
OF
SCIENCE

Science through the Year

By Gerald S. Craig

Professor of Natural Sciences
Teachers College, Columbia University

and Etheleen Daniel

Supervisor of Elementary Education
Montgomery County, Maryland

Illustrated by Albert Jousset

Ginn and Company

Boston . New York . Chicago . Atlanta . Dallas . Columbus
San Francisco . Toronto . London

COPYRIGHT, 1946, BY GINN AND COMPANY

ALL RIGHTS RESERVED

546.1

OUR WORLD OF SCIENCE



Science All About Us
CRAIG · BURKE

Science through the Year
CRAIG · DANIEL

Science Every Day
CRAIG · BALDWIN

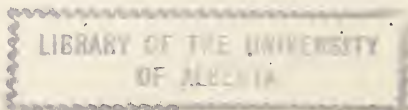
Exploring in Science
CRAIG · HURLEY

Working with Science
CRAIG · HILL

New Ideas in Science
CRAIG · HYDE

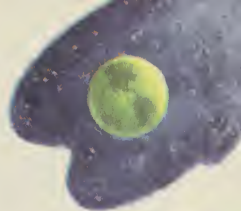
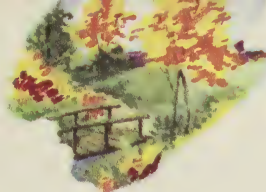
Going Forward with Science
CRAIG · LEWIS

Science Plans for Tomorrow
CRAIG · URBAN



Contents

	PAGE
Weather	6
In the Autumn	16
The Earth	32
Rocks and Soil	50
The Sun	64
In the Winter	76
Air and Water	106
The Blizzard	138
In the Spring	150
The Story of a Plant	170
Making Things Work	176
Animals on the Farm	198
A Visit to the Forest	210



86415





Alices city

Mr. Browns farm

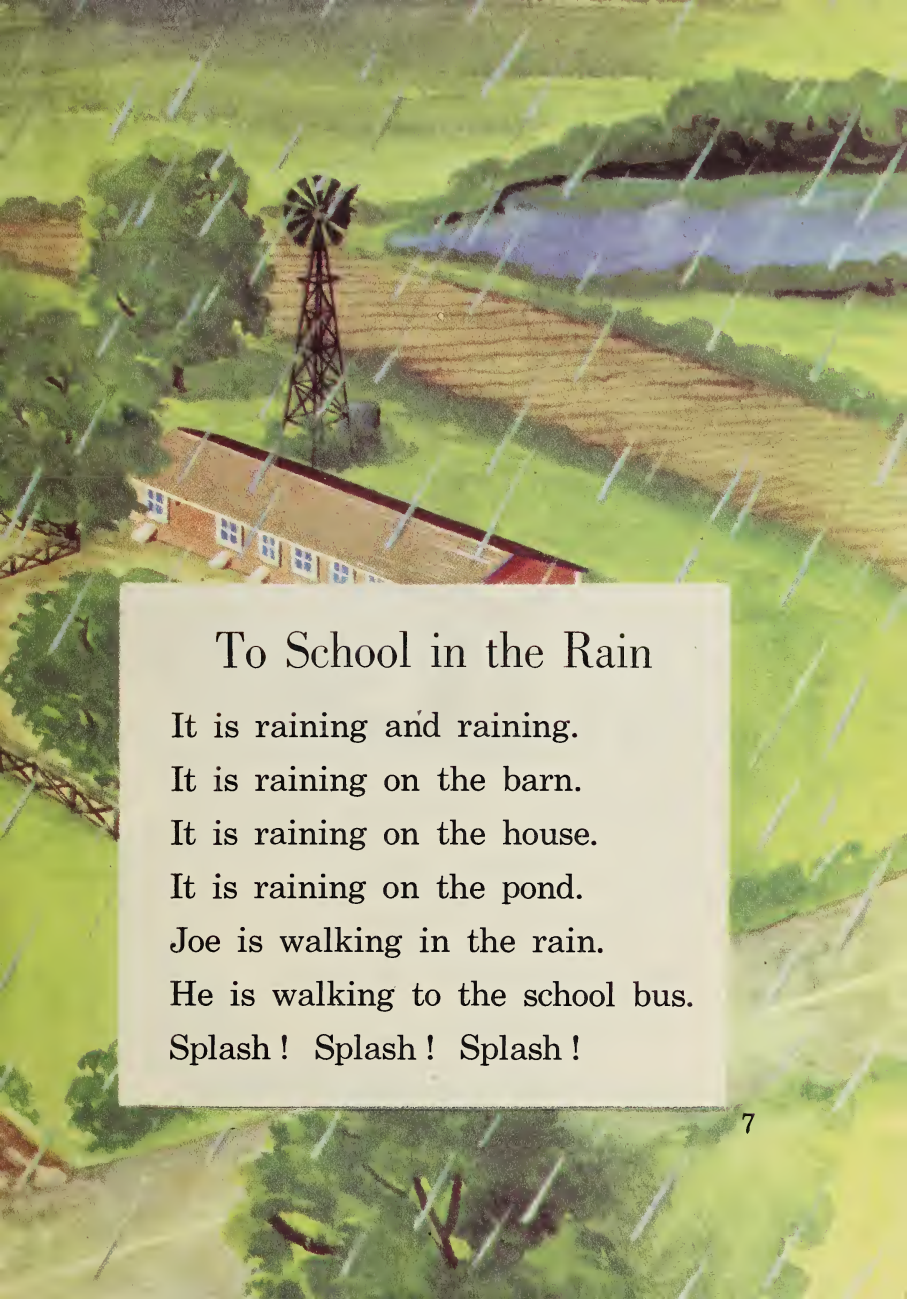
School pond



Joe's farm

Weather





To School in the Rain

It is raining and raining.

It is raining on the barn.

It is raining on the house.

It is raining on the pond.

Joe is walking in the rain.

He is walking to the school bus.

Splash! Splash! Splash!



Everything is wet but Joe.
His rain hat is wet.
His rain coat is wet.
His rubber boots are wet.
But Joe is dry.
He is dressed for rainy weather.

Joe is waiting in the rain.
He is waiting for the school bus.
Toot-oot. Toot, toot, too-oot.
Here comes Joe's bus.
Joe gets in.
Away he goes to school!





Joe's school is on a hill.

Slowly, slowly the bus goes up the hill.

Chug-a-chug. Chug-a-chug. Chug-a-chug.

Now the bus is on top of the hill.

The children are looking out of the bus.

They are all looking at the storm.

They can see clouds over the woods.

They can see clouds over the farms.

What stormy weather !



There are flashes of light in the clouds.

That is lightning.

Flash ! Flash ! Flash !

Then there is a big noise.

Thunder !



This is not just a rainstorm.
It is a thunderstorm.
Boom-m. Boom-m. Boom-m, boom.
Some of the children are afraid.
“Let’s not be afraid,” says Joe.
“Thunder is a big noise.
Thunder never hurts us.”



The bus stops at the school.

The children get out.

Miss Gay is waiting for them.

They feel safe in the school.

The school is made safe.

Lightning will not hurt them there.

Just now the lightning is not near.

It is high in the clouds.

It is far, far away.

All Kinds of Weather

School is out now.

The children are all at home.

Joe is in the barnyard with his father.

It is not raining very hard now.

There is no lightning and thunder.

A cool wind is blowing.

Joe and his father are looking at the sky.



"Will it rain tomorrow, Father?"
asks Joe.

"It may not," says Father.

"But how can you tell?" asks Joe.

"The clouds are moving higher,"
Father says. "The wind is changing.

It is blowing hard now.

The air feels cooler, too.

Tomorrow may be bright and sunny."

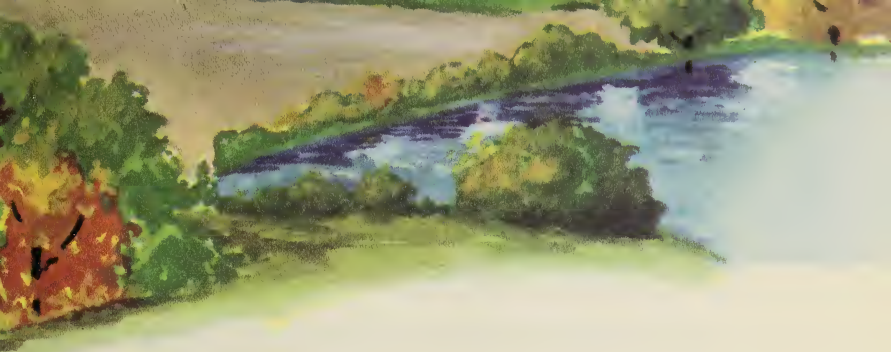
Storms come. Storms go.

There are all kinds of weather.



In the Autumn





A Walk in Autumn

Summer is over and autumn is here.

It is not as hot as summer.

It is not as cold as winter.

It is cool now.

It is just right for a walk.

The children like to take walks.

They like to look at the trees.

The leaves are changing color.

They are yellow and red and brown.

The leaves are falling, falling.

They are falling to the ground.

One day the children said, "Let's go to the pond.

Let's see if our water animals are there.

Last spring we saw some baby animals.

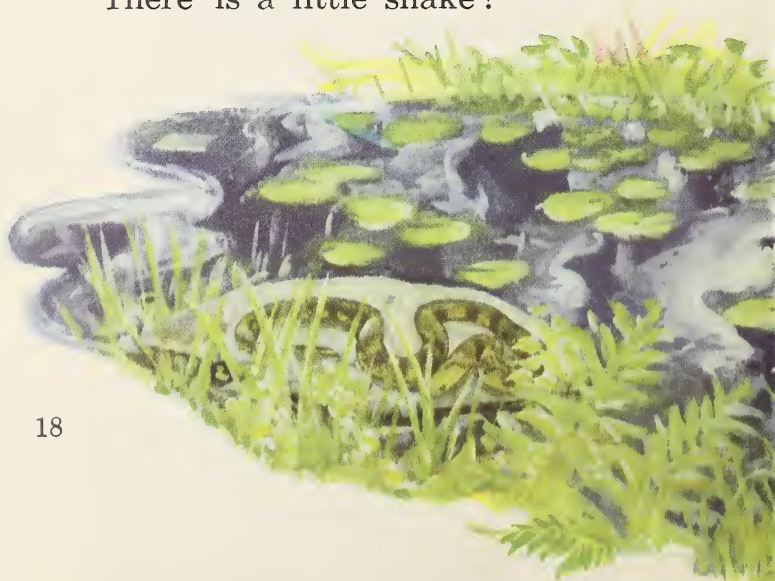
Do you remember the little turtle?

Do you remember the tadpoles?"

Down the hill went the children to the pond.

"Look, look," said Mary.

"There is a little snake!"



"Where is it? I can't see it!"
said Joe, looking at the pond.

"It is over there on the rock,"
said Mary. "It is hard to see.
It is just the color of the rock."

Joe walked slowly to the rock.
He did not want to scare the snake.
It was so quiet there by the pond.



"That is a water snake!" said Joe.

"Let's not hurt it.

Let's not scare it away.

A water snake never hurts anything."

The water snake moved a little.

Then it dived into the pond.

"It wants to get away," said Joe.

"Did you see it dive?" said Mary.

"It is a good diver."

"And a good swimmer, too," said Joe.

"I wish I could dive and swim like that!"



Birds in Autumn

The children walked around the pond.

They were looking for more animals.

"Where are all the animals?"

asked Joe.

"Last spring we saw many animals
down here at the pond.

We saw turtles and tadpoles.

We saw many birds too."

"There are some birds here
that you don't see," said Miss Gay.

"They are hiding."



"Why are they hiding?" asked Jane.

"Did we scare them?"

"They were not hiding last spring."

"They were noisy in the spring,
but now they are quiet," said Miss Gay.

"Their old feathers are falling out.

New feathers are growing in.

They are getting new feathers.

Birds hide when they get new feathers.

See, here is a feather!"

"Here is another feather," said Joe.

"Here is another and another!"

said Mary.



"Soon after the birds get new feathers, some will fly south," said Miss Gay.

"This is moving time for the birds.

Some will leave today.

Some will leave tomorrow.

Some will leave next week or the next.

Now they are eating.

Birds eat and eat before they leave for the south."





“ Could we see them eating ? ”
asked Jane.

“ Where could we find them ? ”
asked Mary.

“ One day I saw them eating
near the woods,” said Joe.

“ They eat together in little flocks.”

“ I want to see them eating
in little flocks,” said Jane.



Miss Gay and the children walked
toward the woods.

“There they are!” said Joe.

There was a soft noise in the bushes
and in the leaves on the ground.

Up flew a flock of birds.

They flew around and around.

Then they came down
into the bushes and leaves.

They wanted to eat some more seeds.

“The birds are very quiet,” said Mary.

“They don’t sing. Do you remember how the robins sang in the spring?”

“Birds are not the only animals that do different things in autumn,” said Joe.

“Let’s come back next week and look for more animals,” said Jane.

“The tadpoles will be frogs now,” Joe said. “Let’s look for them and the turtles. Maybe they are hiding too.”





Cocoons in Autumn

The next week the children took another walk to the woods.

"There is an animal that is ready for winter," said Miss Gay.

"Where?" asked the children.

"Right there above Mary," said Miss Gay.



“But that is a cocoon,” said Mary.

“Is a cocoon an animal?”

“No, a cocoon is not an animal,”
said Miss Gay. “But there is an animal
in the cocoon.

The animal will live there all winter.
In the spring a moth
will come out of the cocoon.”

“May we take the cocoon
back to school?” asked Mary.

Miss Gay said, "The animal in the cocoon will live better out of doors where it is cool.

It is too warm and dry in the school."

"If we take the moth to school, it will be too warm," said Joe.

"It will come out of its cocoon before winter is over.

It will come out too soon."

"Then we shall want to let it fly away, but it will be too cold out of doors," said Mary.

"A moth can't live out of doors in the winter," said Joe.

"But in the spring it won't be too cold."

"It will be just right for a moth," said Mary. "Let's leave it here.

We can come back often to see it."

What Can You See?

Do you live in the city?

Is there a park in your city?

Is there a tree you can watch
in the autumn?

Do you see any cocoons?

What are the animals in the park
doing in the autumn?

Do you see plants and animals
on your way to school?

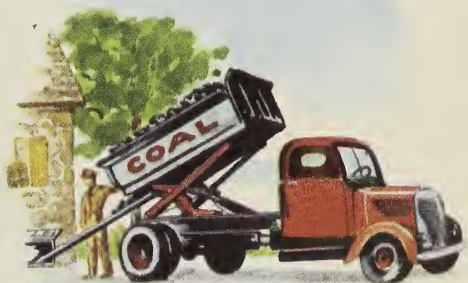
Are there birds on the street?

Do you live in the country? If you do,
you can watch the plants and animals
on the farm.

Maybe you can see some of the things
that Joe and the other children saw.

Do You Know?

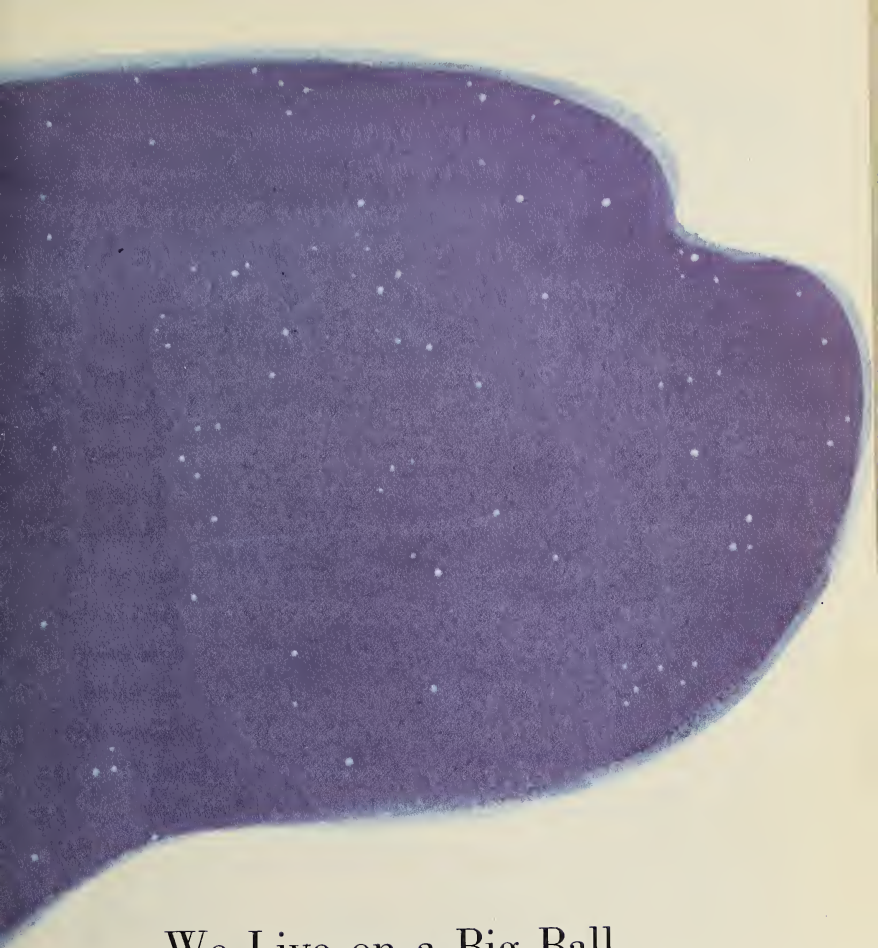
What are these people doing
in the autumn?



What other things are people doing
in the autumn?

The Earth





We Live on a Big Ball

We live on a big ball.

This big ball is called the earth.



The Earth Is Big

The earth is very big.

There are many farms on the earth.

There are many cities on the earth.

There are many animals on the earth.

There are many plants on the earth.

There are many people on the earth.

The earth is very big.

From the Hill Top School Joe can see
Farmer Brown working in the field.

He can see the school pond and brook.

He can see the big woods.

He can see a river far, far away.

The farm and the pond and the brook
are parts of the earth.

The woods and the river are parts
of the earth.



Joe's father has a big farm.
It has big corn fields and big woods.
It has a big field for the horses
and cows.

But the farm is only a tiny part
of the earth.





Alice lives in the city.

She can see the lake in the park.

She can see many trees in the park.

She can see the long streets
where the policeman helps her.

The park and lake are parts
of the earth.

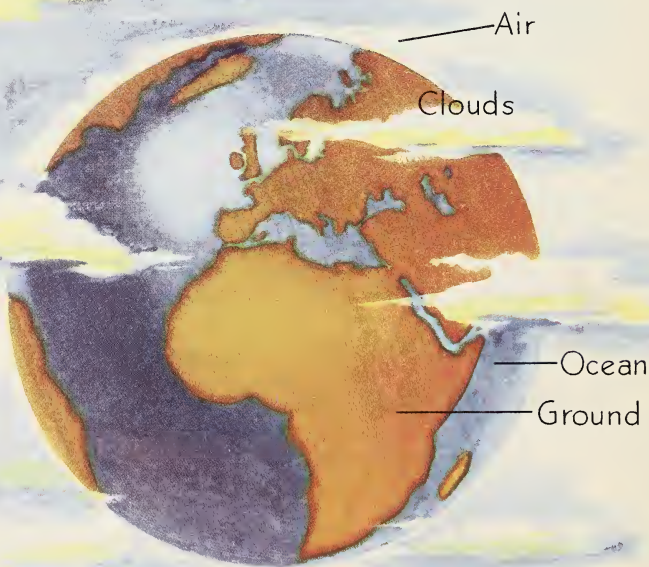
The trees and streets are parts
of the earth.

The ground is part of the earth.

The ocean is part of the earth.

The air belongs to the earth.

The clouds belong to the earth.





The Earth Is Round

The earth is round.

It is a big round ball.

Ships sail around the earth.

Airplanes fly around the earth.

Some day you may go around the earth.

You may go in a ship or an airplane.



The Earth Pulls

When we throw our balls into the air
they come back.

The balls come back to the ground.

The earth pulls them back down.

We can not throw our balls so high
that they do not come back to the earth.

It would be a funny earth if our balls
did not come back to the ground.

When we jump up, we come back down.
The earth pulls us back down.
It would be a funny earth
if we did not come back.
But we always do come back.

Alice and Betty were playing.
Alice slipped and fell bumpety-bump.
The earth pulled her down hard.
Alice said, "What goes up, comes down.
The earth pulls hard."



The earth holds the school
to the ground.

The earth pulls on the school so hard
that the school stays where it is.

You know where to find the school.
It does not move away in the night.
It does not fly off into the sky.
It does not fly off to the moon.





It would be a strange earth
if it did not pull on the school.

Some morning you would not find
your school.

You and your teacher would be looking
all around for your school.

But the earth never plays a joke on us.

The earth pulls all the time.

It keeps us from going off
into the sky.

It keeps us on the earth.

Birds fly up into the air, but they
always come down again.

Airplanes fly up into the air, but they
always come back down.

Balloons go up into the air, but they
do not go to the moon.

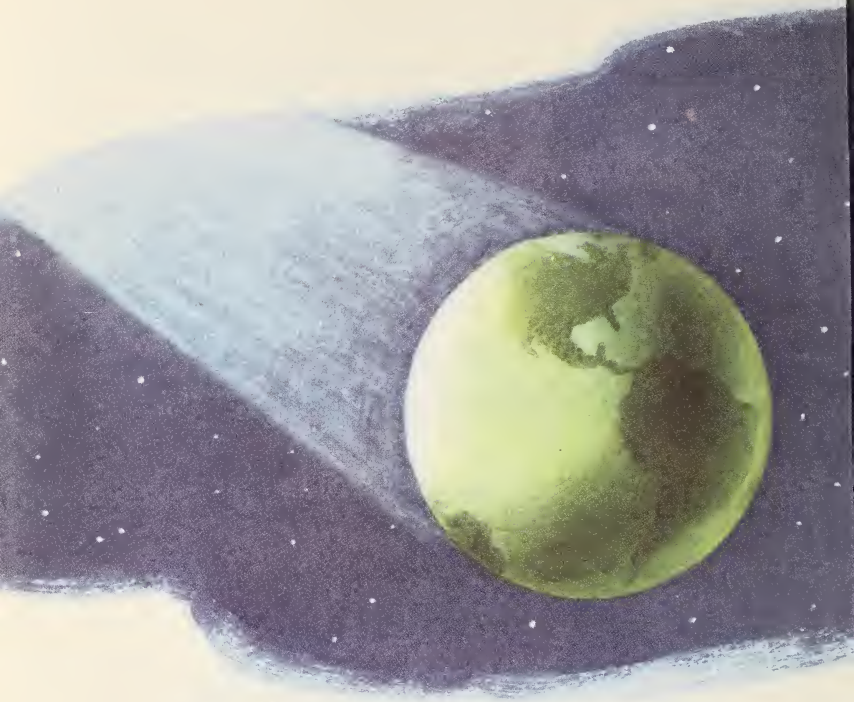
They always come down again
to the earth.



The earth pulls on everything.
It holds things to the ground.
The earth keeps us on the ground.
It keeps us from walking around
in the air.

When we slip, we fall down.
It would be strange if we fell up.





The Earth Moves

The earth is a big moving ball.

It is moving all the time.

It never stops moving.

It moves all day.

It moves all night.



The earth takes us with it all the time.

It is giving us a ride.

We are riding on the earth all the time.

The earth moves very fast.

The earth moves faster than ships.

The earth moves faster than trains.

The earth moves faster than airplanes.

Do You Know ?

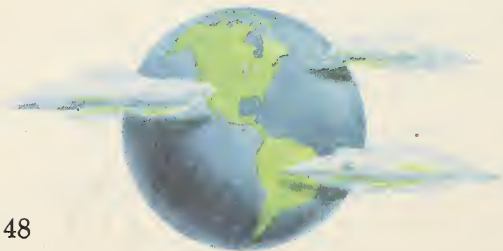
1. Why does a toy airplane come back when you throw it up into the air ?



2. What pulls you down to the ground when you jump up ?



3. What would happen if the earth did not pull on things ?



Things to Think About

1. You live on a big earth.

What other things live
on the big earth?

2. Make a picture of the big earth.

What shall you put in the picture?

3. Why do airplanes always come back
to the ground?

4. What other things that go
into the air come back to the ground?

5. Have you ever moved off the earth?

6. Has your father ever moved
off the earth?

7. Does the air belong to the earth?

8. Is the ocean a part of the earth?

9. What makes you think
that the earth is big?

10. What makes you think
that the earth is round?

Rocks and Soil



Rocks in the Park

In the park near Alice's school
there were many, many rocks.

Some of the rocks were big.

They were so big that the children
could not pick them up.

Some of the rocks were little.

Some of them were round and smooth.

Some of them had sharp edges.



Some of the rocks were soft.

They were so soft that Betty
could break them with her hands.

The rocks would break
into little tiny pieces.

"The rocks break up into dirt,"
Alice said. "You see these tiny pieces
are dirt. Rocks make dirt."



Miss White said, "Many people call these tiny pieces dirt. But I don't like to call them dirt.

Dirt is made in other ways."

"We get dirt from chimneys,"

Jack said.

"We get dirt from cleaning streets."

"Yes," said Miss White. "But we get soil from rocks.

Soil is made when rocks break up into little pieces."



Some of the hard rocks had sharp edges. The children rubbed the rocks together. They rubbed the sharp edges. They rubbed and rubbed the rocks together.

"Something is coming off the rocks," Alice said. "It is part of the rocks. It is dust from the rocks."

The children rubbed more and more. There was more dust from the rocks. Jack said, "That dust is the soil Miss White was telling us about. See! The sharp edges are getting smooth."



“ Would this rock dust make good soil for our plants at school ? ” Alice asked.

“ No,” said Miss White. “ This dust would not be good soil. Soil is made from rock. But it takes a long time to make good soil.”

Good soil is more than rock dust.

Leaves and stems of plants die down and help to make good soil.

Earthworms help to make good soil.

It takes a long, long time to make good soil.



Some of the rocks in the park were smooth.

In the brook the children found many smooth rocks. The sharp edges had been rubbed off.

The children saw the way that water makes the rocks rub together.

"Every school does not have so many different kinds of rocks near by," said Miss White. "We have many kinds to study."

"We like to have rocks to study," Betty said.



"A farmer would not like all these rocks," said Miss White.

"They would get in his way."

"I have been on a farm," said Alice.

"If this park were a farm, some of these rocks would have to be moved away."

"Yes, but rocks are useful," Betty said.

"Think of all the rocks that are used in the city. Rocks are used to make some of the big buildings."

Rocks are useful in other ways.

What ways can you tell about?



Soil on the Farm

One day the children at Hill Top School were looking at their flower boxes.

Mary said, "We need some good soil for our plants."

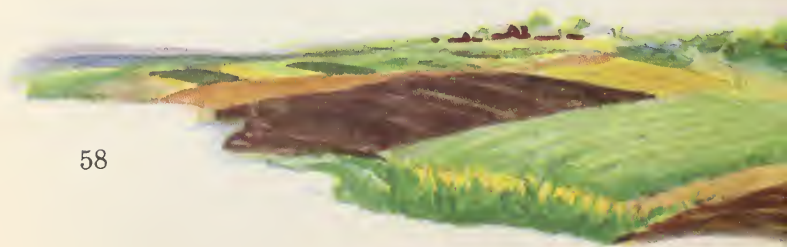
"I can bring some soil from our farm," Jane said. "We have good soil on our farm.

Shall I bring some to school?"

"I can bring some soil, too," Joe said. "We have some yellow soil on one part of our farm. There is some red soil too.

In the woods there is black soil.

Which kind do we want to fill our flower boxes?"



Mary said, "Let's see how many different kinds of soil we can bring to school."

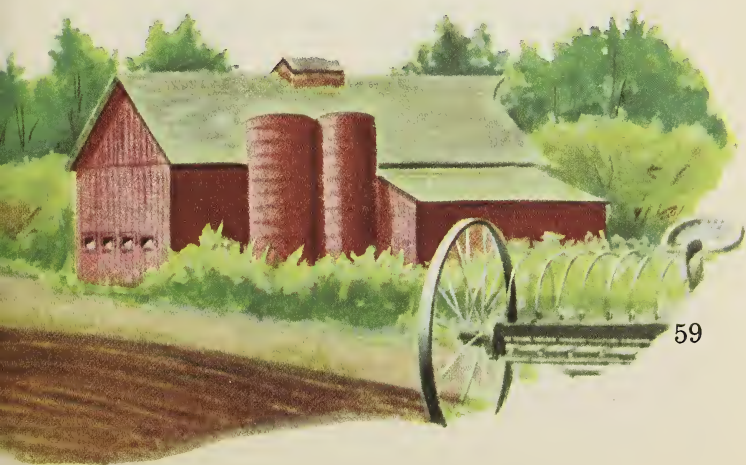
"It would be good to see how many kinds we can find," said Miss Gay.

"Let's bring some of different kinds.

Joe can bring some red soil.

Mary, can you bring some yellow soil?"

"We can go into the woods and get some black soil," said Joe.





The children found many different kinds of soil. They got soil from the brook. They got soil from the playground. They got soil from many places.

They had red, yellow, white, and black soil.

They had soil with little pieces of rocks in it.

They had soil with no rocks in it.

They had soil with sand in it.

There were many kinds of soil in the farms near Hill Top School.

The children filled the flower boxes with soil from the woods.

An Experiment with Soil

Try to bring some different kinds of soil to school.

Bring the kinds that you can find near your home and near your school.

Put each kind of soil in a different glass jar.

Now plant a seed in each jar.
Your teacher will tell you a kind of seed that grows fast.

Put the jars in the sun.

Water the soil in each jar every day.





Look at the glass jars every day.
How soon do the plants begin to grow ?
Do the seeds in every jar grow ?
As the little plants grow,
watch them every day.
Are all the plants big ?
Do some of the plants grow better
than others ?
Do any of the plants die ?
What does your experiment tell you
about kinds of soil ?

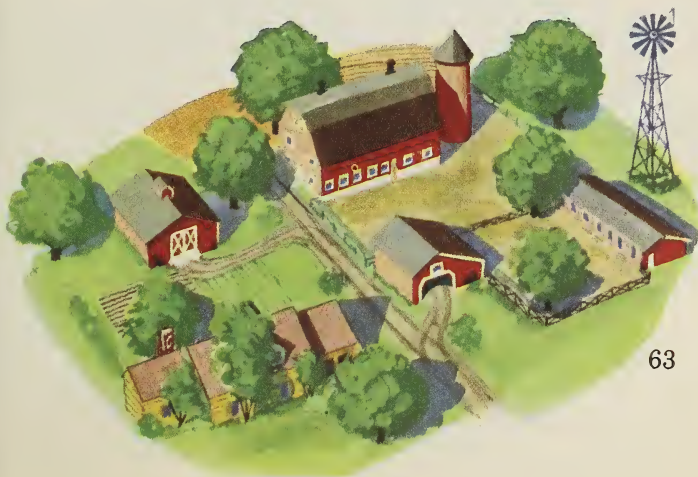
Something to Think About

Joe's father says that soil is useful
to our country. We need soil.

He says that we would have
nothing to eat without soil.

He says that soil isn't dirty.
It helps to give us good food.

Joe's father likes to work on his farm.
He takes good care of his soil.
He is working to make it better.
He is a good farmer.



The Sun



The Morning Sun

It is morning in the country.

The sun is coming up.

It is coming up back of the barn.

The sun looks small to Joe.

It looks smaller than the barn.

It looks smaller than the trees.

It looks like a red ball in the sky.

C2





The Sun Is Large

It is morning in the city, too.

The sun looks small to Alice.

But the sun is not small.

It is very large.

It is larger than many barns.

It is larger than Joe's farm.

It is larger than Alice's city.

It is larger than the moon.

It is larger than the big earth.

It is larger than many big earths.



The Sun Is Hot

The sun is a very, very hot ball.

It is hotter than a candle.

It is hotter than a stove.

It is hotter than many stoves.

The sun is hotter than any fire
on the earth.

It is so hot that it heats the earth.

The sun is so hot that it gives off light.
It lights the earth. It lights the moon.
The sun is shining all the time.
All the time it gives off heat.
All the time it gives off light.



People need the heat and the light
of the sun.

Green plants need the heat
and the light of the sun too.

They need light to grow.

Animals need the plants for food.

People need the plants and animals.





The Sun Shines All the Time

The sun is shining all the time.

It shines on bright days.

It shines on cloudy days.



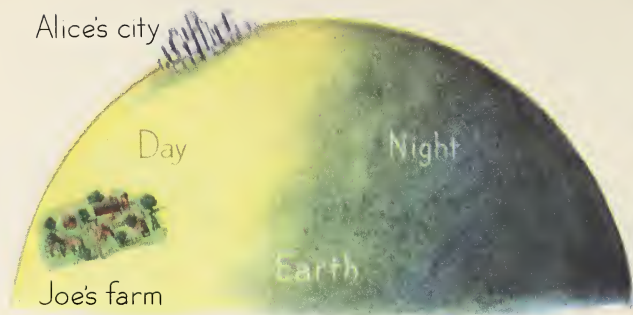
The sun shines above the clouds
on cloudy days.

The clouds make the day seem
a little dark to us.

We are in the shadow of the clouds.

Airplanes go above the clouds
and find the sun shining.

They fly in the sunshine
above the clouds.



“The sun is not shining at night,”
Joe said.

“It is not shining on us,” Jane said.
“But it is shining somewhere at night.
It shines on the other side of the earth.”

There are other people who have day
when we have night.

Some people on the earth are working
while we are sleeping.

Some people are sleeping while we are
at school.

But the sun is always shining
somewhere.

Shadows in the Sunshine

One day Joe and Jane were walking over the field. Sometimes they liked to walk home from school.

"See my shadow," said Joe. "It is as big as my father.

Now I look like a man."

Joe walked like a man.

His shadow did the same thing.





Joe and Jane went on in the sunshine.

"Your shadow looks bigger than my shadow," Jane said.

"I am bigger than you are," Joe said.

"But I can make my shadow fly," Jane said. "See, Joe! It looks like an airplane."

"I can make my shadow jump," Joe said.

Joe took a big jump. His shadow jumped, too.

Jane and Joe laughed at their funny shadows.

An Experiment with Shadows

Make your room at school as dark as you can. Ask one boy or girl to help your teacher.

Your teacher will hold a flashlight toward the boy or girl who is helping.

Do you see a dark place on the floor?

Does it look a little like a picture of the boy or girl?

Ask the boy or girl to jump up and down. What happens to the shadow?

Take turns holding the flashlight and making the shadows.

Try to make some funny shadows.

Try to make some big shadows.

Try to make some small shadows.



In the Winter



A Walk in the Winter

Winter has come to Hill Top School.

"Now is a good time for us to go to the school pond and to the woods," said Miss Gay. "It is a good time to see our plants and animals."

"Oh, Miss Gay, will we see any animals today?" said Jane. "It is so cold.

There won't be any animals in the woods or around the school pond."

"Our farm animals are in warm barns," said Joe.

Miss Gay said, "Let's go and see what plants and animals we can find."



The children put on their warm coats and hats.

Down to the pond they went.

Many trees had lost all their leaves.

The ground was covered with snow.

The children made tracks in the snow as they walked toward the pond.



There were other tracks in the snow.
A rabbit had gone hoppety-hop.

There were his tracks in the snow.

"It was not too cold for the rabbit
to be out of doors," said Jane.

"The rabbit has a fur coat,"
said Mary. "He can keep warm
on cold days. His fur keeps him warm."





Near the woods the children found the tracks of a deer. He had come out of the woods.

“It is cold today,” said Joe.

But it isn’t too cold for the deer to be out.

Maybe the deer was looking for food.”

Winter Birds

There were other animals about on this cold winter day. There were some birds in the bushes near the woods. They were eating seeds.

"Not all the birds flew south, Miss Gay," said Jane. "Do you remember the flocks of birds we saw last autumn?"

Some of them did not fly to a warmer place for the winter.

There are birds here now."



“Many birds did leave last autumn,” said Miss Gay. Then she told the children about the winter birds.

“Some birds stay here all winter. They stay with us all year round.

Some kinds of birds come to us in winter. They come to us from the north where it is much colder.

They stay with us through the winter. This is their winter home.

When spring comes, they will leave for their summer home in the north.”

“Don’t the birds get cold here?” said Jane.

“Yes, Jane,” said Miss Gay. “Winter is a hard time for many animals.

But many animals have ways of keeping warm.

Many animals live through the winter.”



The children looked at the birds.

The birds had fluffed out
their feathers in a funny way.

This made them look big and round.
It helped them to keep warm.

The feathers were like a warm coat
around the birds. Fluffing their feathers
helped them to keep warm in the winter.

“The birds don’t have coats to put on
when it is cold,” said Jane. “They don’t
have fur. They fluff up their feathers.”

Animals at the Pond

Miss Gay and the children walked on to the pond.

“Are there any animals about today?” Miss Gay asked.

“Yes, there are animals about,” said Joe. “We said it was too cold for them. It is a good joke on us.”

“The rabbit keeps warm in his fur coat,” said Mary.

“The birds fluff out their feathers.”



"These animals can keep warm in winter," said Joe. "They know how to find something to eat too."

"We don't see any insects today," said Mary. "We don't see the turtle and frogs that were here last autumn."

"What about the fish in the pond?" said Joe. "We don't see them today."

Jane said, "We don't see the young water snake either."



Joe laughed. "Maybe the snake flew away with the birds."

"Don't be funny, Joe," said Jane. "Snakes can't fly. And you know why we can't see the fish. The pond is covered with ice. The fish are under the ice."

The children could not find all the animals that they saw last autumn.

On this cold winter day they could not find many animals at the pond.

The young water snake was there last summer. He was there last autumn. Now they could not find him.

Insects were about in the spring and summer, too. There were flies and mosquitoes and butterflies. There were frogs and the turtle.

The children could not see any of them now.

Where could all the animals be?

They didn't fly away.

Most insects can fly, but few insects
could fly far away to a warmer place.

Could the fish leave the pond?

They could not walk away.

They could not fly away either.



Some animals do not go to a warmer place in autumn. Some animals do not look for food in the winter.

These animals find a place where the cold winds do not get to them.

Then they go to sleep. They take a long rest. They sleep until spring.

In the autumn water snakes find a place for their long rest. Some of them sleep under rocks.

Turtles and frogs find a place to sleep, too. Some sleep in the mud under the school pond.

Here they are safe from winter's cold. Here they sleep and sleep and sleep. They sleep all winter long.

Many insects rest in the winter. Some insects make cocoons that keep them dry.

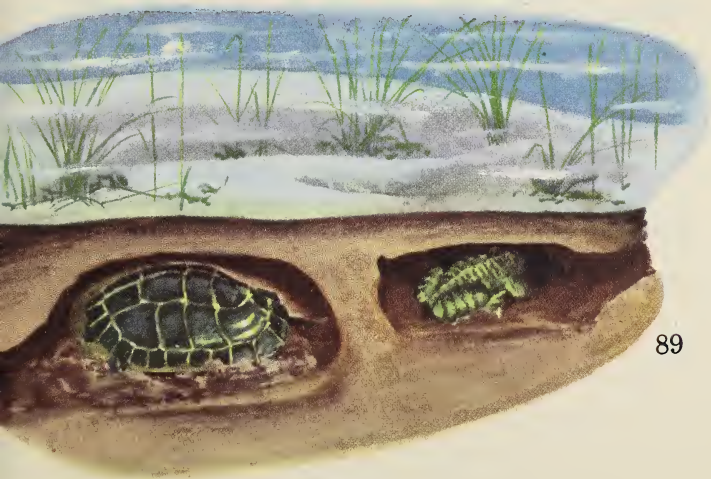
They rest in their cocoons all winter.
When they wake up in the spring,
they fly away.

The fish in the pond swim around
under the ice. When it is very cold,
they swim slowly.

Joe said, " That is funny. Some animals
move more slowly when it gets cold.

When it gets cold, I want to run faster
to get warm. It is cold here now.

Let's run back to school."



Animals on the Farm

Jane said, "Miss Gay, the horses on our farm do not fly away in winter. They do not sleep all winter either. They are out of doors most of the time."

"Yes," said Joe, "but they do not look the same in winter."

"I know," said Jane. "In the winter they have a warm coat of hair. Horses don't put on hats and coats in the cold weather as we do."

"Yes," said Miss Gay. "Horses get a new coat of hair in the autumn. Other animals that are out of doors in the winter get new coats, too."

"My father says that horses fluff up their hair," said Joe. "This helps them to keep warm on cold days."



“Last winter our horses looked so funny,” said Jane. “They didn’t look like our horses.

I didn’t know the horse father gave me. She came up and pushed me with her nose. Then I saw that she was my horse.”

“Soon spring will come,” said Joe. “Our horses will look different then.

They will not have so much hair. They will look better in the spring.”

Some Plants Live All Winter

One day the children at Hill Top School were looking out of the window.

"Look, Miss Gay," said Mary.

"The grass is all dead. It is brown. It is not so green as it was last summer."

Miss Gay said, "The grass looks dead. The part that you see died down to the ground last autumn.

But the grass is not all dead. Its roots are not dead. The roots of the grass will live all through the winter.

The roots live under the ground. Cold weather does not kill them."

"In the spring the grass will begin to grow," Joe said. "It will get green."

"Today the grass looks dead, but it will grow again," said Miss Gay.



“I don’t see how any plant can live out of doors now,” said Mary. “It was cold waiting for the bus this morning.

I was afraid my nose would freeze.”

“When we get cold we can go into the house,” said Joe. “But plants can’t walk into a warm room.

They must stay out of doors.

Plants stay outdoors all winter.”

"I see a big plant which lives all winter," said Miss Gay. "You have many of them on your farm, Joe. We can see many of them here at school."

"I know," said Joe. "You are thinking about trees. Trees live through the winter."

I am glad that trees do not die in the winter. If they did, we would not have any trees in the spring."

"The trees do not look the way they did in autumn," said Miss Gay. "Trees do many things before winter comes."

"Some trees lose their leaves in autumn," said Mary.

"Trees make buds, too," said Miss Gay. "These buds are made before autumn comes. Cold weather does not hurt the buds. In the spring leaves begin to grow from them."



Mary said, "How do trees know enough to get ready for winter?"

"Do trees think about getting ready for winter?" asked Miss Gay.

"No, the trees don't think," said Mary.

"A tree does not tell the leaves to drop off, but they do," said Miss Gay.

"All trees don't lose their leaves," said Joe. "The pines in our woods don't lose their leaves."

Some trees keep their leaves in winter. Pines and some other kinds of trees are evergreens. Evergreens keep their leaves in winter. Their leaves stay green.

Some Plants Cannot Live in Winter

"Look at our zinnias. Do they live through the winter?" asked Jane.

"No," said Miss Gay. "Our zinnias are dead. They will not grow in the spring. But they left something that will make new zinnia plants."

"They left seeds," said Joe. "I saw some of their seeds this morning. They were on the dead flowers."

"Then the seeds will make new zinnia plants next spring," said Jane.



Think and Do

1. Joe said, "Just a little cold weather can kill plants if they are not ready for it."

Why do you think Joe was right?

Why do you think winter is a hard time for plants and animals?

2. What happens in winter where you live?

Do you live where winters are not cold?

Do you live where winters are cold?

Does it snow where you live?

3. What trees that you know lose their leaves in winter?

4. Try to find seeds on some dead plants. Look in your garden and in the woods.

5. Could you make a picture of winter where you live?



Winter in the City

Winter has come to Alice's city, too.
Snow has been falling, falling.
Snow covers the ground in the park.
Snow covers the streets and sidewalks.
Snow is on the tops of the cars.

The big snowplow is at work.
"Chug-a-chug" sounds the snowplow.
The snowplow is cleaning the street.
Cars cannot go through too much snow.
People need clean streets to go
about their work.



In the city, people are pushing snow from the sidewalks into the street.

Alice's father is cleaning the snow from the sidewalk.

Alice is helping her father clean away the snow.

Snow covers the ground in the park. When children come to the park, they can see many animals.

They see pigeons and house sparrows. These birds are looking for peanuts that people throw to them. Pigeons and house sparrows stay about all winter.

There are some other winter birds in the park, too. They do not leave for warmer places. They do not sleep all winter either, as some animals do.

These birds can live through the winter. They can find something to eat.



There are squirrels in the park.
People often give them peanuts.

When it gets very cold, the squirrels find a place to sleep. They may sleep for a day or two at a time.

When it is warmer the squirrels come running out. They do not sleep so long in winter as turtles and frogs do.

Sometimes the squirrels hide their peanuts. Sometimes they hide them in places where they go to sleep.

In cold weather the squirrels eat the peanuts they stored away. They eat the peanuts if they can find them.





There are rats in the park, too.

Rats are around all winter.

They do not take a long rest.

They do not store food for cold weather.

People will not feed them.

But sometimes the rats take peanuts
away from the other animals.

They take the peanuts away from
the squirrels and pigeons and sparrows.

People do not like the rats.

Sometimes the children see chipmunks in the park.

In winter days the chipmunks sleep much of the time. They sleep in their homes under the ground.

Here they eat food which they stored last summer.

Now and then a chipmunk wakes up.

If it is warm, he goes outside.

If it is cold, he eats and goes back to sleep.

The children see very little of the chipmunks in the winter time.





Some animals sleep all winter.

Some animals sleep when the weather is very cold. They sleep for many days at a time.

When the weather is warm, they wake up and run about.

Some animals only sleep a little while each day. They are awake much of the time.

What Animals Live Near You?

1. You have learned about animals in the country and in the city.

Which of these animals live near you?

2. Look for animals that live near you. What do they do in winter? How do they live through the cold weather?

Something to Think About

1. How does flying away help some birds to live all winter?

2. How does sleeping all the time help some animals to live all winter?

3. How do animals that are out on cold days keep warm?

4. How do fish stay alive when water in the pond is frozen?

5. In winter the grass looks dead and frozen. Why will it grow again?

Air and Water



Air



Air Is around Us

Air is around us.

It is in our houses.

It is out of doors.

It is over Joe's farm.

Air is over Alice's city.

It is over the park.

It is over the streets.

We are in the air all the time.

The clouds are in the air.

Air goes up high over us.

It goes up high above the ground.

It goes above the clouds.



Air is in the soil too.

Alice puts some soil in a glass jar.

The soil is very dry.

Alice puts some water in the jar.

The water runs down into the soil.

Soon Alice sees bubbles in the water.

The bubbles are made of air.

The air comes from the soil.

The water pushes the air out of the soil.

There is air in soil.

Plants need air and water in soil.

Air Pushes against Things

Alice gets up on a chair.

She has two pennies.

Alice drops the pennies.

They fall to the floor.

The pennies fall together.

The pennies hit the floor together.



Betty gets up on a chair.
She has a penny in one hand.
She has a paper in the other hand.
She drops the penny and the paper.
The penny falls faster. It hits
the floor first. The penny wins the race.
More air pushes against the paper
than against the penny.
That is why the paper does not fall
so fast as the penny.
The air keeps the paper from winning
the race.





Jack makes a ball out of the paper.
He gets up on a chair.
He holds a penny in one hand.
He holds the ball in the other.
The penny and the ball fall to the floor.
They fall together.
The penny does not win the race.
The ball does not win the race.
They hit the floor together.

Alice holds a paper ball in one hand.
She holds a big paper in her other hand.
The paper ball and the big paper fall
to the floor.

Which one hits the floor first ?

Which one wins the race ?

Which one does the air keep
from winning the race ?



The Parachute

Alice is making a parachute. She wants
a parachute for her little wood doll.

She ties the doll to the parachute.

It looks like this.



Alice goes out of doors. She rolls
the doll up in the parachute.

She throws it up into the air.

The parachute opens.

The doll comes down slowly.

The air pushes against the parachute.

The air keeps the doll from falling fast.



Fire Needs Air

Miss White had four candles.
She put the candles on the table.
Then she put four glass jars
on the table.

One jar was very large.

The other jars were smaller.

Miss White lighted the four candles.

The candles burned. They were on fire.

Miss White asked the children
to help her.

When the teacher said "go,"
they put a glass jar over each candle.

Which of the candles went out first?
Which candle went out last?

The children did the experiment again.
They wanted to see if the candles
would do the same thing.

The candle in the very small jar
did not burn long. It went out first.

There was very little air in that jar.
The candle needed air to burn.

The candle in the biggest jar burned
longer than any other. It burned
and burned.

There was more air in the big jar.
The candles needed air to burn.



Alice put a candle on the table.

Miss White lighted the candle.

The candle burned and burned. It burned until there was not any candle left.

There was air in the schoolroom.

There was so much air in the schoolroom that the candle burned and burned.

It burned until it was all burned up.

The Air in the Balloon

Jack took a balloon. He blew
a little air into the balloon.

The balloon looked like this.

The balloon was not filled with air.



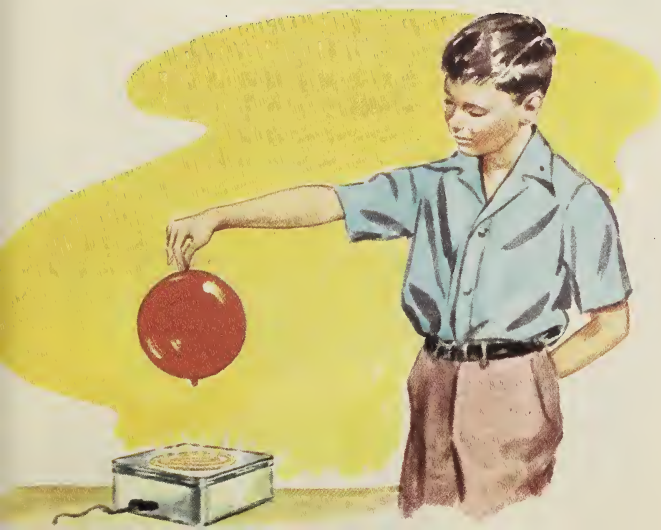
Then Jack held it over a stove.

The balloon got warmer. The air
inside the balloon grew warmer, too.

The air got hot. The air got larger.

It made the balloon larger.

Then the balloon looked like this.





Betty blew air into a balloon.

She blew and blew.

The balloon got larger and larger.

Betty held it over the stove.

The balloon got larger.

Bang ! went the balloon.

Betty looked all around.

“ What made that noise ? ” asked Betty.

“ What happened to my balloon ? ”

Why did Betty’s balloon go “ bang ” ?

Can you tell ?

What Does the Air Do for Us?

These children are helping to get supper out of doors.

First they put some paper in the place for the fire.

Then they pick up wood for the fire.

What other things do they need to make the fire burn?

What does air do for us?

How many things can you tell about?





From Water to Ice

"I can walk on water," said Joe.

"That must be a joke," said Jane.

"You can't walk on water."

"Yes, I can," said Joe. "I am walking on water right now."



"You are walking on ice, but ice isn't water," said Jane.

"Ice is water," said Joe.

"Ice is frozen water."

"You are right, Joe," said Jane.

"That is a joke on me. Ice is frozen water."



From Snow to Water

One day Joe and Jane were looking
at the falling snow.

The flakes fell faster and faster.

The snow looked soft and white.

“Soon everything will be covered,”
Jane said.

“The trees will be covered with snow.

The ground will be covered, too.

The birds’ feeding station will be
covered by the flakes of snow.”

Joe said, " We should clean the birds' feeding station.

We should clean off the snow. We should put out food for the birds."

" Let's bring some snow into the room," said Jane. " Let's take the snow off the feeding station."

Joe opened the window. Jane filled her two hands with snow.

The snow was soft and cold.

Jane said, " Joe, please get me a jar. The snow is wet and cold."



Jane put the snow in the jar.

Then the children watched to see what would happen.

"See, the snow is turning to water," said Joe. "The snow melts fast when we bring it into our warm schoolroom."

Jane let some snow fall to the floor.

What happened to the snow on the floor?





“Put the water on the plants, Joe,” said Jane when all the snow had melted.

“No,” said Joe. “I am going to try something else.”

He opened the window. He put the jar of melted snow outside the window.

“We can make ice,” said Joe. “We can turn the water to ice.”

It is very cold out of doors. Soon the water will freeze to ice.”

Joe watched and watched the water in the jar.

From Water to Steam

Miss Gay watched the children playing with snow, ice, and water.

“There are other things you can do to water,” she said. “Let me show you.

I shall change water into something that is not hard and cold like ice.

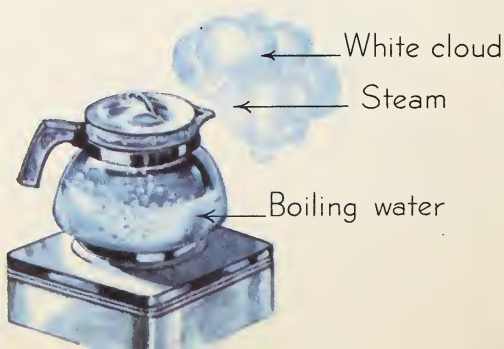
It will not be wet like drinking water.

I shall change it so you can not see it.”

Miss Gay put some water to boil in a teakettle on the stove.

The water boiled and bubbled.

“Listen! The water in the teakettle is singing,” said Jane. “The water is boiling faster and faster.”



Much steam came from a little water.
The steam was near the spout
of the teakettle.

"We can not see steam," said Miss Gay.

"What we see is a cloud that is made
out of the steam. Never put your hand
near the spout in the steam.

Steam is very hot."

"You can not see anything at the spout,"
said Joe. "Isn't that strange!

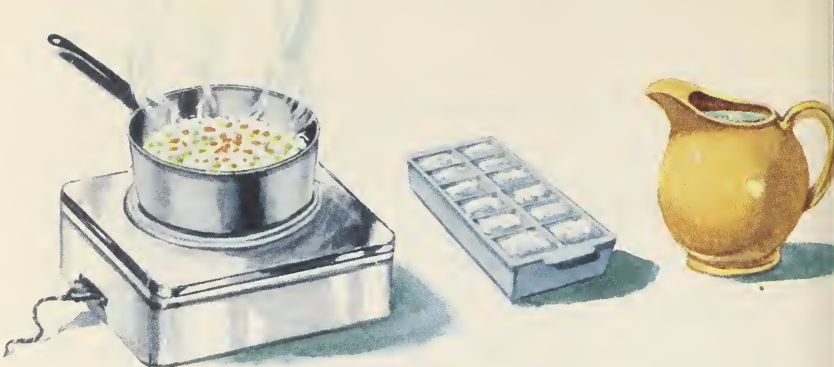
Steam is there, but you can not see it."

"May we put our hands
in the white cloud?" asked Jane.

"Yes, feel it but keep your hand away
from the teakettle. Feel the cloud,"
said Miss Gay.

Jane held her hand in the cloud.

"Oh, it is wet," she said. "The cloud
is wet."



Now Do You Know?

Water can be found in three ways.

One is ice.

One is water like that we drink.

One is steam.

You can not see steam.

How do you change ice to water?

How do you change water to ice?

How do you change water to steam?

In what ways is water useful to us?

Tell about the ways you know.

What Do You Think ?

1. Why was Joe right when he told Jane that he could walk on water ?

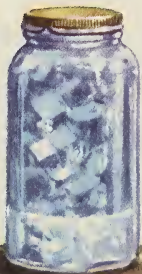
2. Some places are cold in the winter. Other places are not so cold. Will water freeze out of doors where you live ?

Try This Experiment

Put some ice in a covered jar. Take it to school to use for experiments with melting and freezing.

Does your ice change to water before you get to school ?

Does all of your ice melt ?





Smoke in the Air

From the schoolroom window
the children see many chimneys.

Smoke is coming from most
of the chimneys.

The smoke comes from burning coal.
It goes high up into the air.

Up, up the smoke goes over the houses.

Up, up the smoke goes over the school.



“ See the smoke coming
from the chimneys,” said Jack.

“ There is smoke in the air,”
said Alice. “ That is where some dust
comes from. It makes our schoolroom
very dirty.

Let’s clean the dust away
from the chairs and tables.”

Sometimes the city is very smoky.

Alice's mother has to clean the house often. She and Alice clean the rooms and wash the windows.

She says to Alice, "The city is so dusty. It is so dirty."



“Some day our city will be clean,” says Alice’s father. “Some day people will learn a better way to burn coal. The coal will not make as much smoke.

It will help everyone when people learn a better way to burn coal. The city can be made as clean as the country.

Some day, Alice, you may live in a city as clean as the country.”





Smoke and White Clouds

Alice and Betty were helping to get supper.

"See the white smoke coming from the teakettle," said Alice.

"That is not smoke," said Betty.
"We are heating water in the teakettle.
We are not burning water.
Did you think that water could burn?"

Betty had learned that smoke is made when things burn.

We can burn wood. We can burn coal. We make smoke when we burn things like wood and coal.

When water boils in the teakettle, the water changes into steam. The steam makes a white cloud. But there is no smoke.

Water does not burn.

"Hear the water bubbling," said Alice.

"The water is boiling in the teakettle," said Betty.

"When water boils it makes steam, and the steam comes out of the spout.

The little white cloud is made out of the steam. It is not made out of smoke."



Where Does the Water Go?

Joe found two glass jars.

He put two cups of water in each jar.

He put a cover on one jar.

He left the other jar open to the air.

Every day Joe looked at the water
in the jars.

Did the water stay in the covered jar?

Did the water stay in the open jar?

Jane put two cups of water in a jar.
She did not cover the jar.

She put two cups of water in a pan.
Each day some of the water in the pan
was gone.

Each day some of the water in the jar
was gone.

The water in the pan was evaporating.
The water in the jar was evaporating.
It was evaporating into the air.

Did the water evaporate faster
from the pan or from the jar?



The Blizzard





News

from the Weather Bureau

One winter day Miss Gay
and the children walked to the woods.

They looked for winter animals.

They looked for signs of spring.

It was not cold out of doors.

They liked their walk.



When they came back, there was news for Miss Gay. It was news from the men at the Weather Bureau.

"We must go home now. The busses will soon go," said Miss Gay.

"Are we to have a vacation?" asked Joe.

Miss Gay said, "You may call it vacation. We shall have no more school today. A blizzard is coming this way."

"What is a blizzard?" Jane asked.

"A blizzard comes from the north where it is very cold," said Miss Gay.
"It comes in the winter when there is much cold air in the north."



“Air is moving all the time,”
said Miss Gay.

“The air from the very cold places
sometimes moves into the warm south.

It will bring cold weather.

We may have much snow.

It may snow all night and tomorrow, too.

The snowplow may be needed.

The wind will blow and it will be cold.

When you come to school tomorrow,
take care to wear warm clothes.”

Joe said, "How do the men at the Weather Bureau know so much? It is not cold here now."

Miss Gay told the children that some people study the weather.

There are people all over the earth who study the weather. Each one lets the others know what he finds out.



There are many people who work
at the Weather Bureau.

They can tell how wet or dry the air is.

They can tell how warm or cold the air is.

They can tell where the wind comes from.

They can tell how fast the air is moving.

They can tell much about the weather.

The men at the Weather Bureau help
the farmer. They help people in the city.

"They help us," Miss Gay said.

"Today they are telling us to go home.

The bus is waiting for us now."





Soon the children were home.
The air was moving fast now.
The wind was blowing hard.
It was coming from the cold north.
Snow fell faster and faster.

"I guess the men at the Weather Bureau know what they are saying," said Jane.

"The blizzard is here. It is snowing hard now. The wind is blowing."

Caring for the Farm Animals

When Joe got home he ran to tell his father about the blizzard.

Father was taking the cows to the barn.

Father said, "Mother told me that the blizzard is coming this way. She heard the news on the radio."



“The Weather Bureau helps us,”
said Father. “It told us that
the blizzard is coming.

I am glad you are home now.
I need you to help me.”



"We must put the cows and horses in the warm barn," said Joe. "They must not be out in the blizzard."

"Many animals need our help now," said Father.

"We must feed our winter birds, too," said Joe. "As soon as it stops snowing I will put some food out. I will put it on the birds' feeding station."



Watching the Weather



After the blizzard the weather was like this for a few days.



Then the weather was like this.
The children liked this weather.



The next day the weather was like this.
The children could not play outdoors.



Then the weather was like this.
What kinds of weather can you tell about ?

In the Spring





One day at Hill Top School Mary asked, "Will spring come soon? Will it be here next week? I want to run and play out of doors. I want warm weather."

Winter had seemed long to Mary. Snow had come and gone. For a day it would be warm and then it would turn cold again.



At last spring did come.

When Mary saw the first violets by the brook, she said, "Now I won't have to wear my warm coat all the time.

The violets are here. They are a sign that spring is here, too."

"Shall we go down to the pond today?" asked Miss Gay.

"Yes," said the children. "Let's go to the pond. Let's see what is going on there now."



The children saw that woods and fields
were changing color.

The grass in the school yard
was getting green.

Green is the color of spring.

New leaves were coming out of the buds
on some of the trees.

The tiny new leaves looked like red
and yellow fluff.

Soon the little leaves would turn green.

Living things were getting ready
for summer.

Birds Are Moving Again

The pond did not seem like the same place to the children. When they were there last winter everything was quiet.

Then they could hear the wind in the trees. They could hear the water in the little brook. But these were the only sounds they could hear.

Now that it is spring there are many singing sounds. The birds have come back singing.

It is the birds' moving time again. Last autumn they moved south. They are moving north now.



Some of the birds are stopping only to eat and rest. They will fly on for days to find homes.

Some of the birds are coming back to the woods near Hill Top School. Some of them will stay all summer.

The birds are singing. Many of them are looking for something to eat.

They do not seem like the birds of last autumn. Then the birds were not so noisy.



Now there are many, many birds.
There are birds in the bushes.
There are birds high up in treetops.
There are birds high in the air.
They are flying here and there.
The birds are noisy.





Many of the birds are getting ready to have little birds. Some father and mother birds are looking for a good place to build a nest.

Some birds have made their nests. Some mother birds are laying eggs.

Mary said, "This morning I was awake before Mother called me. The birds were singing outside my window.

I heard a robin. I like to hear the robins sing in the morning."

Other Animals Are Waking Up

"Soon we shall see many insects," said Miss Gay. "The butterflies and moths will be flying about. Here is an old cocoon. The moth has gone away."

"And remember the mosquitoes," Joe said. "They will soon be back, too."

"I like butterflies," Jane said. "But I don't like mosquitoes."





"Another animal will be flying in a few days," said Miss Gay.

"I am thinking of something that is not a bird and not an insect. I am thinking of bats. They will be in the air at night catching insects.

Bats have slept all winter. Now that spring is here, they will wake up."

"I wish the bats would catch all the mosquitoes," Joe said.

The children heard the frogs singing in the strange way frogs sing.

Jane said, "Animals make many different noises, don't they ?

Think of the noises that horses and cows and chickens and frogs make."

"Think of the noises that dogs and cats and birds make," said Mary.

"Maybe the little water snake is ready to wake up from his long winter sleep," said Jane. "Maybe if we make some noise, he will wake up."

"I don't think that noise will wake snakes from their long winter sleep," said Miss Gay. "Spring and warm weather wake them up.

We must watch for our water snake. The sun is warm and bright today. He may be awake from his winter sleep."

"We must watch for our turtle and the frogs, too," said Jane. "They have been sleeping all winter. They have been sleeping in the mud."

"The frogs must be awake today," said Joe. "We heard them singing."

"Frogs and turtles are funny," said Mary. "But it is a good thing they have slept all winter."

They are not like birds. Birds keep warm on cold winter days."

"They are not like horses and dogs and cats," said Joe. "Horses and dogs and cats can keep warm on a cold day."





“Turtles and frogs cannot keep warm on a cold day,” said Jane. “They must find a place where cold winds cannot get to them. They live there through the winter.”

The children said that the frogs and turtles were funny for sleeping all winter in the mud. But the animals were alive on that spring day!

The turtles and frogs had slept in the mud until spring. That was why they were alive.

New Plants and Animals

Spring and summer is a time when new plants are beginning to live. It is a time when there are many new animals.

"Soon we will have many little chickens on our farm," Joe said.

"The little chickens come from eggs."

"I know another animal that comes from eggs," Miss Gay said. "Its eggs are in our school yard right now."

"Where are there any eggs in the school yard?" Joe asked.

"In the pond," said Jane.

"I know!" Joe said. "There are frogs' eggs in the pond. I saw some one morning.

Tadpoles will come out of the eggs. Let's look for tadpoles now."

Mary said, "Animals are not the only things that are growing now. I saw some violets by the brook. Shall I bring them to school?"

"Violets are wild flowers," Jane said. "They belong by the brook. They do not belong in our school."

If you leave them by the brook other people may see them. They will stay pretty longer there than here at school."

Jane was right. The plant might make seeds if Mary left the flowers. If the seeds were left, there might be more violets by the brook next spring.



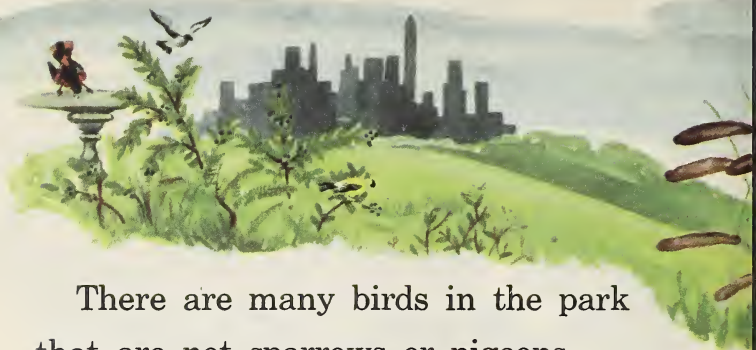


Spring in the City Park

Spring has come to the city too.

You cannot see so far in the park now
for the trees have tiny new leaves.

Bright flowers are growing
in the gardens.



There are many birds in the park that are not sparrows or pigeons.

Some of them are stopping to rest and eat. Tomorrow they will move on.

Some birds will stay in the park. It is a good place for laying their eggs and taking care of their young.

One part of the park is made into a good home for birds.

There are many bushes which have berries for birds to eat.

There is water for the birds, too.

There are no dogs or cats to scare them.

People in the city want the birds to stay in the park.



There are ducks on the lake
in the city park.

There are flower gardens there, too.
There are flowers all spring and summer.

People sit and look at the green grass
and the trees. They can see
the bright flowers and butterflies.

They can listen to the singing
of the birds. They can watch the birds
eating berries and insects.

People like this part of the park.
They call it the Bird Park.

Can You Tell?

1. What animals do you see
in the spring that you did not see
in the winter time?



2. What plants do you see
near your home and your school
in the spring?



Watching the Seasons

It is fun to watch the seasons in the city. It is fun to watch them in the country too.

1. What season is a resting time for many plants and animals ?

2. What season is the time for many plants to begin to grow ?

3. In what season do the birds build nests and lay their eggs ?

4. Some people say that the first robin is a sign of spring. What signs of spring do you know ?

5. In what season do some animals store up food ?

6. How do plants and animals get ready for the next season ?

7. Do you like one season better than another ? Why do you like it better ?

The Story of a Plant





Plants need water

The children at Alice's school had many plants growing indoors. They planted tree seeds in one box. They called it their tree box.

They planted apple seeds, acorns, and other tree seeds in the box. They had plants growing in jars, too.

They learned how to water the plants. They learned not to water them too much.

They learned that too much water pushes the air out of the soil. Plants need air in the soil.

Roots and stems grow better when there is not too much water.

The boys and girls learned
that almost all plants need light.

Some plants need bright sunshine.

Other plants live better where it is
not so bright. The children learned
that some plants grow in the woods
where there is not much light. But some
plants must have much sunshine.

On the day after spring vacation,
Miss White said, "I have news for you.
One of our plants is sick.

The plant was put on the floor
where it is dark. It did not have
enough light. It had no water.
Our plant is almost dead."

The children looked at the sick plant.
There were only a few leaves on the plant.
The stem and leaves were almost white.
Most of the leaves had dropped off.



Alice said, "Our poor, poor plant !
It helped to make our room pretty. No one
cared for it, and now it is sick.

Maybe it is dead. How can we tell
if it is dead, Miss White ? "

" Let's see if we can make it live,"
Betty said. " Maybe it isn't dead.

Maybe we can make it live. Then it
will make our room pretty again."

So the children put the plant on the table near the window. Each day they looked after it. They gave it just enough water. They turned the jar around.

In a little while the plant did not look so sick. It looked as if it might live.

One day Alice said, "Our plant is going to live. See the tiny leaves on the stem!"

"Good!" Betty said. "Our poor plant is going to live."

Miss White said, "Many plants work hard to live. That is why we find plants in so many places on the earth."





Day after day the children watched the plant. More leaves came.

The spring sunshine helped the plant.

There was good soil in the jar.

The water the children gave the plant helped it. It grew larger every day.

The roots and stem and leaves were growing. The plant was growing.

The children were very happy. They were happy that they had helped their plant to live.

Making Things Work





The Wind Moves Many Things

Sometimes air moves slowly.

Sometimes air moves fast.

It moves fast when the wind blows.

The wind moves many things around.

It moves clouds about in the sky.

It blows papers about.

It blows smoke away from chimneys.

It blows dust about.

It blows snow about in a snowstorm.

The wind makes waves on water.

Jack cut some long papers. He tied them to a string. Then he tied the string to the window.

Jack watched the papers move. Sometimes the papers moved out from the window.

Sometimes the papers moved into the room.

The wind was blowing into the room from the out of doors. It moved the papers in and out of the room.





The Wind Is Strong

Alice and Jack were walking to school.
It was a rainy day.

Alice had her new umbrella.

The wind was blowing hard.

Jack said, "The wind is pushing us
to school."

Then the wind blew from a different way.
It pushed so hard against the inside
of Alice's umbrella that it turned it
almost inside out.

"See what the wind did," she said.

"My poor umbrella! It won't keep
the rain off me now."

The policeman helped Alice. He turned
the umbrella toward the wind,
and the wind turned it outside in.

"Thank you very much," said Alice.
"Now I can use the umbrella again."





The next day Jack was flying his kite.
It was tied to a long string.
He said, "The wind is strong.
My kite pulls hard on this string."



The Wind at Work

Joe's father has a windmill. He has
put wind to work on the farm.

The wind makes the windmill work.
The windmill pumps water
for the animals to drink.

It pumps water for people to drink.

The wind is useful.



Joe's father said, "If we didn't have the windmill, Joe, you would have to pump water every day.

We use water in the house.

Mother needs water for her work.

We must drink water every day.

The cows need water to drink. •

Without the wind we could not have so many cows. We could not pump enough water for them."

Winds are used to move ships and boats with sails. The wind pushes against the sails and moves the ships.

One day Jack was sailing his boat on the lake in the park. The wind was blowing hard. It blew the sailboat far out on the lake.

Jack asked a policeman to get his boat.

The policeman said to Jack, "Tie a strong string to the boat. Then it will not sail away in a hard wind."





The wind helps some animals. The deer in the woods back of Hill Top School smells the air. He puts his nose into the wind and sniffs and sniffs.

Sometimes he can tell when dogs are near. The moving air has the smell of the dogs. The deer can smell them before he sees them.

Then he runs back in the woods where the dogs can't find him.

The wind helps the deer by bringing the smell of the dogs to him.



Water at Work

Water moves things. On Joe's farm there is an old water mill. It was made by Joe's grandfather.

The water from the brook was used to turn a big water wheel.

Round and round the big wheel turned. In the mill Joe's grandfather ground his wheat. He ground the wheat for other farmers, too.



The water wheel is not used now.
But Joe walks to the mill sometimes
with his father.

“Your grandfather used the brook
to work for him,” says Joe’s father.
“We do not use the water in the brook
to work for us.”

In some places big wheels are turned
by water today. Joe’s father told him
about these big wheels. The water makes
them go round and round.

The wheels turn machines that make
electricity. Water works for us to help
make electricity.





Electricity on the Farm

At one time there was no electricity on Joe's farm.

There was no electricity for lights.

Mother used oil lamps to light the house. Father used an oil lantern when he worked in the barn at night.

Now electricity has come to the farm.
Oil lamps and lanterns are not needed.

Electricity lights the house.

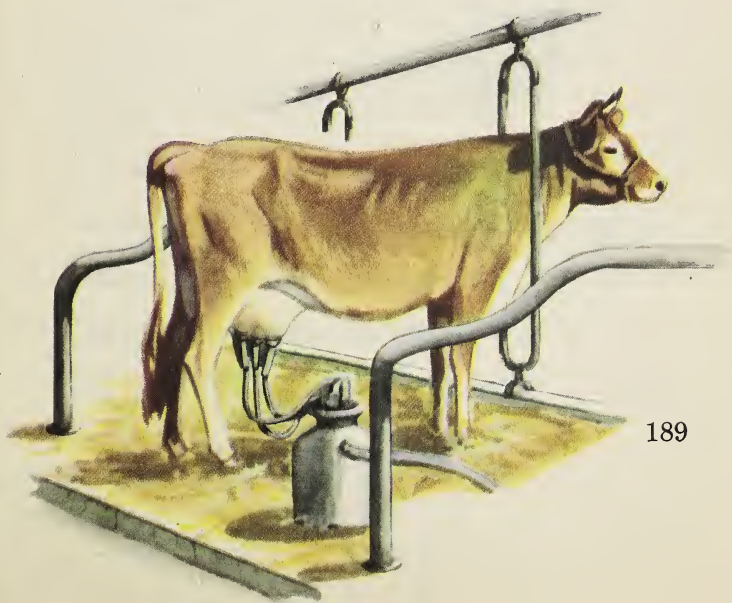
Electricity lights the barn.

Electricity runs the milking machine
that Joe's father uses to milk his cows.

Now Joe's father has many more cows.

Electricity helps him to do his work
so that he can take care of more cows.

Now he can sell more milk in the city.





Steam at Work

Steam is used to move things.

Steam is made in a big engine.

Steam is made when water boils.

Coal is burned to make the water
boil.



Steam is strong. A steam engine can pull many cars. It can pull many milk cars.

The milk from Joe's farm goes to the city in a milk train. The train is pulled by a big engine.

Puff puff, puff puff! The engine pulls the train to the big city.

Horses and Tractors

Joe's grandfather used horses
to help him do the work on the farm.

He did not have a tractor.

He did not have gasoline either.

Joe's father uses horses but he
uses a tractor too.

He has gasoline to run his tractor.



"I like the horses, Father," said Joe.
"But sometime I want to learn to use
the tractor."

"Sometime you shall, Joe," said Father.
"But I am glad you like the horses."

We have strong horses on the farm.
I like them, too. We must always take
good care of them."





“We must see that the horses have enough food and water,” said Joe.

“Yes,” said his father. “And we must see that they do not work all the time. We must be kind to them.”

“Father, you don’t have to be kind to the tractor,” said Joe.

“It is a machine. It is not alive. You don’t have to give a tractor food. You just give it gasoline.

You don’t have to be afraid that a tractor will work too hard.”

“In a way you are right,” said Father.
“A tractor does not feel the way
a horse does. But we must take care
of the tractor too.

A machine must be oiled. Parts of it
are made of iron. It should not be left
out in the rain to rust.

I want you to learn how to take care
of the tractor.”





Joe wanted to find out more about rust.

So he put some iron nails in a glass of water and watched the nails for a week. The nails turned brown. There were brown flakes in the glass.

Joe's father said, "The nails are rusting. The brown flakes are iron rust. That is what happens to things made of iron when they get wet."

After a few weeks the nails were no good. They had rusted too much.

Joe said, "I see what might happen to the tractor if we left it out in the rain."



Something for You to Find Out

1. What is there near you which shows how water, wind, gasoline, steam, and electricity work for us? Tell about it.

2. Try to visit places like the ones in these pictures. Watch the work that is going on. Tell about what you see.



Animals on the Farm





Alice Visits the Farm

In the summer vacation Alice went to her Uncle Tom's farm. Her Uncle Tom is Joe's father.

Uncle Tom said, "Now we shall have more help. We have much work to do."

"May I milk the cows?" asked Alice.

"We shall see, we shall see," said her Uncle Tom, laughing.

"I am going to pick berries tomorrow, Alice. Will you help me?" asked Joe.

"That will be fun," said Alice.

Bullsnakes Live on the Farm

The next morning Joe and Alice went down near the garden to pick berries.

"Oh, look, look, Joe," said Alice.

"There is a snake. Kill it, kill it!"

"No, no, Alice, don't scare it," said Joe. "That is one of the animals I wanted to show you.

It belongs to our farm. It helps us. It may be the mother of some of the other snakes on the farm."

"I don't like snakes," said Alice.

"How can a snake help you?"

"There are snakes that can hurt us," said Joe. "But most snakes never hurt us.

Some snakes help us. This one helps us very much. It is a bullsnake. We never hurt it, and so it is not afraid of us."

Joe told Alice how the bullsnake helps his father.

At one time there were many rats and mice on the farm.

Rats and mice eat corn. They eat other things, too. Sometimes the rats kill chickens and ducks.

This bullsnake and her children help Joe's father. They keep rats and mice away. Now there are very few rats and mice on the farm.



In the winter no one sees the snake.
Joe's father thinks the snake stays
under some rocks all winter.

In the spring when it is warm
the bullsnake comes out from the rocks.

It wakes up. After it has slept
through the cold of winter, it stays
in the sunshine for a long time.

Joe said, "This is a mother bullsnake.
Father is always glad to see her
in the spring.

Father says she is warming up
for the summer. She is getting ready
to work on the farm."



"Does this mother snake have any little babies now, Joe?" asked Alice. "I wish I could see them."

"No, not now, Alice," said Joe. "The mother snake lays eggs much as the chickens do. The little snakes come from the eggs."

"Does the mother snake take care of her babies?" Alice asked.

"No," said Joe. "The little snakes do not need a mother's care."

The bullsnake is not like a mother cow. The mother cow looks after her baby."

"Maybe we can see the baby snakes this summer," said Alice. "I should like to see them."

"We will watch for them," Joe said. "If we watch, I think we will see them some day soon."



Skunks Live on the Farm

“It is time for us to go to the house. Mother will be waiting for us,” said Joe’s father. “It is getting very dark.”

“Oh, see the black and white cat and her kittens,” said Alice.

“I didn’t know that you had kittens on the farm. Why didn’t you tell me?”



Joe laughed and laughed. He said,
“That is a joke on you, Alice. These are
not kittens. They are skunks. Don’t try
to pet them.”

“Sometimes people call skunks
wood kittens,” said Joe’s father. “A skunk
won’t hurt you if you don’t hurt it.”

“Skunks live under the barn,” Joe said.
“They help keep mice away.”

“Skunks help us on the farm,”
said Joe’s father. “We never hurt
a skunk.”

Skunks also eat insects. They eat insects which eat plants in the garden and in the fields.

When Joe and Alice and Joe's father were going home from work, the skunks were on their way to work. They were on their way to the garden. They work and eat at night.

Many people do not want skunks on a farm. They say that skunks eat eggs. They say that skunks sometimes go into the chicken house and eat the eggs.

Joe's father wanted the skunks to live on his farm. So he made a good chicken house. The skunks cannot get into it. Now they cannot eat the eggs.

But they can eat the mice under the barn. They can eat the insects in the garden. They can help on the farm.



Owls Live on the Farm

Joe and Alice were helping
at the barn. It was getting dark.
Just then there was a funny sound,
“Oooh, oooh.” Alice jumped.

“What was that?” she said to Joe.

“Don’t be afraid,” said Joe. “That is
one of the animals that helps us
on the farm. It is one of our barn owls.

Owls keep the mice away. Father likes
to have the owls about the barn.

There are some bats in the barn, too.”



There had been many mice on the farm. Then a father and mother owl came to live near the barn. They lived in a tree.

Soon they had four little owls. They would often catch mice for the little owls to eat. The babies needed much food to grow.

Now the little owls were growing up. Soon the little owls would help Joe's father in the barn, too.

"Oooh, oooh," said the owls.

The Animals on the Farm

1. What animals did Alice find on her Uncle Tom's farm ?
2. How did the bullsna~~k~~e help on the farm ?
3. What did the bullsna~~k~~e do in the winter ?
4. What did the bullsna~~k~~e do in the summer ?
5. How did the skunks help ?
6. How did the owls help ?
7. What animals had been on the farm that Joe's father did not like ?

Something for You to Think About

1. What animals help you ?
2. Do they need your help ?
3. What can you do to help them ?
4. What animals do not help you ?

A Visit to the Forest





The Forest Is Useful

“Joe,” said Father, “do you
and Alice want to go with me to our woods?
I want to see our trees.”

Joe was always glad when Father
asked him to visit the woods.

When they got into the woods,
Father stopped now and then to look
at the young trees.

He said, “Some day these little trees
will be big trees, Joe. Some day you
will come here and find these trees big.
You will be bigger then, too.”



“Will I be as big as you?” asked Joe.
“Here is a pine as big as I am now.”

“These little pines are growing and you are growing,” said Father. “It will be fun to watch these little trees grow.”

“Father,” said Joe, “why don’t you have your woods cut down? Mr. Brown had his woods cut down.

You could farm this land then. You would have more land to farm. Maybe you would make more money.”



Then Father told the children why he will never cut down his forest.

“I have farm land,” he said.

“This forest is a part of my farm land. I grow trees here. Sometimes I cut down a few trees and sell the wood from them.

But I plant little trees to grow where the big trees were cut down. I always have little trees growing up here in the forest.

We need trees in the country. The forest is a very useful part of our farm.”



“The forest helps the rest of the farm,” said Father. “The forest is on top of our hill. When it rains, the forest keeps the water from washing the soil away.”

The forest helps to keep the soil from washing down into the brook and the river.”

“You see how many leaves there are on the ground,” he said. “The trees drop these leaves year after year.

Some day when it is raining I will bring you to the woods. Then you can see that the leaves keep the water from running down to the brook too fast.

The water is held back by the leaves. It does not run right into the brook and the river and make a flood.

If we had more forests in the country, we should not have so many floods.”



Father pushed away
some of the leaves on the ground.
The ground was wet under the leaves.

“These leaves help us in another way,”
he said. “They keep the ground wet.
The leaves keep the little plants
that grow in the forest from drying out.

The leaves cover many little plants
in winter. They help the plants to stay
alive until spring.”





Some Animals Need the Forest

"Let's go into the woods and see if we can find a little deer," said Joe.

"Maybe the mother deer has had a little deer this year," said Father.

"She would hide it back in the forest."



“ Do you remember how she would come out of the forest last winter ? ” asked Joe.

“ Yes, Joe, that is another thing to remember when you ask why I do not cut down all of these trees,” said Father.

“ This forest is the home of many animals. There are birds here who need a forest for their home.

The mother deer needs the woods to hide her babies.”



“The animals need a home,” said Alice.
“Where would they go if you cut down the trees?”

“Yes, Alice, the animals need the forest,” said Father. “They would have no place to go if I cut down the trees.

I can remember when the mother deer was a baby deer. She grew up in these woods. This is her home.”



Come Again

"Alice," said Uncle Tom, "you are going back to your city tomorrow. You have worked with us on the farm. We have needed help this summer.

We are glad that you came to help us. We had much work to do."

Alice said, "I have had a good time this summer. I liked the farm. It has been fun to work with Joe. I wish that you would ask me to come again next year."

Something to Think About

1. Why did Joe's father not cut down all of the trees?

2. How do leaves help to keep the soil from washing away?

3. How does grass help to keep the soil from washing away?

4. How do forests help animals?

5. Why do some animals need a home in the woods?

6. Will Joe have the trees cut down when he grows up?

Something to Do

Look for a place with grass to see if

Grass keeps soil from washing away.

Grass makes food for animals.

Grass makes homes for animals.

Vocabulary List

Science through the Year is the second book of a series entitled OUR WORLD OF SCIENCE. The total vocabulary of this book is 571 words. Of these words 320 are introduced and taught in *Science All About Us* or occur in a basic word list for the first grade. These are assumed as known to children in the second grade.

Science through the Year also uses 251 new words, necessary to the development of science concepts. These new words are gradually introduced. No more than four of them appear on any page; and 95 per cent of the new words are used four times or more. Variants are counted as new words except when they are formed by adding the endings *s*, *'s*, *es*, *ed*, *ing*, *y*, and *er*.

The list below includes the new words by pages:

4 Alice's city pond	feel high far	swimmer wish	29 better won't often
5 Joe's	14 cool	21 don't	30 park watch country
7 bus	blowing sky	22 Jane feathers	
8 coat	15 asks tell changing	23 south today week or	31 people 32 earth 33 . . . 34 . . .
10 slowly chug-a-chug top storm	16 . . . 17 hot right falling	24 together flocks	35 field river parts
11 flashes light lightning thunder	18 last remember tadpoles snake	25 toward bushes flew	36 horses tiny
12 boom let's says hurts	19 can't scare quiet	26 robins only different	37 policeman
13 Gay	20 anything dived	27 cocoons above	38 ocean belongs
		28 live moth	39 round ships sail

40 pulls	62 begin	88 rest	111 . . .
throw	63 isn't	until	112 . . .
would	food	mud	113 parachute
41 always	64 . . .	89 wake	doll
slipped	65 small	90 . . .	ties
fell	66 large	91 . . .	114 four
42 holds	67 stove	92 dead	table
off	heats	roots	burned
moon	68 shining	kill	115 . . .
43 strange	69 . . .	93 freeze	116 . . .
teacher	70 bright	94 glad	117 blew
joke	71 seem	lose	held
44 balloons	dark	buds	118 bang
45 . . .	shadow	95 enough	119 . . .
46 . . .	72 while	pin	120 . . .
47 than	73 same	96 zinnias	121 . . .
48 happen	74 . . .	left	122 flakes
49 ever	75 room	97 . . .	station
50 . . .	girl	98 cars	123 should
51 smooth	76 . . .	snowplow	124 melts
sharp	77 . . .	sounds	125 . . .
edges	78 covered	99 . . .	126 drinking
52 break	tracks	100 pigeons	boil
pieces	79 fur	sparrows	teakettle
dirt	80 deer	101 . . .	steam
53 chimneys	81 . . .	102 rats	127 spout
54 rubbed	82 year	103 chipmunks	128 . . .
dust	north	104 awake	129 . . .
55 stems	through	105 learned	130 smoke
die	83 fluffed	frozen	coal
56 been	84 . . .	106 . . .	131 . . .
study	85 insects	107 . . .	132 wash
57 useful	young	108 bubbles	133 . . .
58 which	either	109 against	134 . . .
fill	86 mosquitoes	pennies	135 . . .
59 . . .	butterflies	hit	136 . . .
60 got	87 didn't	110 hand	137 pan
places	most	paper	138 blizzard
61 experiment	few	first	
each			
jar			

139 bureau signs	160 chickens	182 pumps	199 . . .
140 men vacation	161 . . .	183 . . .	200 bullsnakes
141 . . .	162 . . .	184 . . .	201 . . .
142 . . .	163 . . .	185 smells sniffs	202 . . .
143 . . .	164 wild might	186 grandfather wheel	203 . . .
144 . . .	165 . . .	187 machines electricity	204 skunks
145 radio	166 berries	188 oil lamps lantern	205 . . .
146 . . .	167 . . .	189 milking sell	206 . . .
147 . . .	168 . . .	190 . . .	207 owls
148 . . .	169 seasons	191 puff	208 . . .
149 . . .	170 . . .	192 gasoline	209 . . .
150 . . .	171 . . .	193 . . .	210 forest
151 . . .	172 almost sick	194 . . .	211 . . .
152 violets	173 poor	195 iron rust	212 land
153 . . .	174 . . .	196 nails	213 . . .
154 . . .	175 . . .	197 visit	214 . . .
155 . . .	176 . . .	198 . . .	215 flood
156 . . .	177 waves		216 . . .
157 laying	178 string		217 . . .
158 . . .	179 strong		218 . . .
159 bats slept	180 . . .		219 . . .
	181 kite		220 . . .

Date Due

M

N

Q
161
C880
V.2

86415

Q 161 C88 O v.2 c.1

Craig, Gerald Spellman, I

Our world of science. [By Gera

CURRHIST



0 0004 7225 776

1046